Docket No. FE 6168

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Yuri GULEVICH, et al.

Serial No.: 10/594,780 Group Art Unit: 1793

Filed: September 29, 2006 Examiner: Y. QIAN

Title: **MAGNESIUM CHLORIDE-BASED ADDUCTS AND CATALYST COMPONENTS OBTAINED THEREFROM**

APPEAL BRIEF UNDER 37 C.F.R. §41.37

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

A Notice of Appeal was received by the U.S. Patent and Trademark Office in the above-captioned application on February 12, 2010, with a brief due by April 12, 2010. Accordingly, this brief is timely filed.

In view of comments provided herein, Applicant respectfully believes all the pending rejections in the instant application should be withdrawn.

Table of Contents

Real Party in Interest

The real party in interest with respect to the current U.S. patent application and appeal submitted herein is Basell Poliolefine Italia S.R.L.

Related Appeals and Interferences

NONE

Status of the Claims

Claims 1-17: (Cancelled)

Claim 18: (Rejected)

Claim 19: (Cancelled)

Claims 20-23: (Rejected)

Claims 24-36: (Withdrawn)

Claims 18 and 20-23 are currently being appealed.

Status of the Amendments

Applicant mailed a response on June 9, 2009 amending claims 18, 20, 22, 24, 27, 28, 34, and 36, while also cancelling claim 19. Subsequently, a final Office Action was received having a mailing date of November 4, 2009, in which the action indicated all the amendments in the aforementioned response were entered.

Summary of the Claimed Subject Matter

In independent claim 18, Applicant is currently claiming Lewis base adducts comprising a compound of formula $MgCl_n(OR)_{2-n}$, and an aprotic Lewis base (LB) that are in molar ratios to each other defined by formula $MgCl_n(OR)_{2-n}LB_p$ in which n is from 0.1 to 1.9, p ranges from 0.4 to 3, R is a C_1-C_{15} hydrocarbon group, and the aprotic Lewis base is selected from C_2-C_{20} aliphatic ethers and alkyl esters of C_1-C_{20} aliphatic carboxylic acids. See page 2, lines 22-26, and page 3, lines 1-6, in Applicant's specification.

Grounds of Rejection to be Reviewed on Appeal

I. Whether claims 18 and 22-23 are unpatentable under 35 U.S.C. §103(a) to 4,220,554 (herein referred to as "Scata, et al.").

II. Whether claims 20 and 21 are unpatentable under 35 U.S.C. §103(a) to Scata, et al. in view of WO 96/32426 (herein referred to as "Zakharov, et al.")

Argument

I. Rejection of Claims 18 and 22-23 Under 35 U.S.C. §103(a) to Scata, et al.

Claims 18 and 22-23:

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under §103 by (1) determining the scope and content of the prior art; (2)

ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

Accordingly, for the Examiner to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP §2142.

First and foremost, Scata, et al. discloses in col. 3 lines 26-31,

> The reaction of (a), (b) and (c) is conducted under conditions such that the amount of electron-donor compound present in combined form in the solid product separated from the reaction mixture is lower than 1 mole per gram atom of Mg, and in particular is comprised between **0.1 and 0.3 moles per gram atom of Mg**. (Emphasis added)

However, Applicant is currently claiming Lewis base adducts comprising a compound of formula $MgCl_n(OR)_{2-n}$, and an aprotic Lewis base (LB) that are in molar ratios to each other defined by formula $MgCl_n(OR)_{2-n}LB_p$ in which n is from 0.1 to 1.9, **p ranges from 0.4 to 3**, R is a C_1-C_{15} hydrocarbon group, and the aprotic Lewis base is selected from C_2-C_{20} aliphatic ethers and alkyl esters of C_1-C_{20}

aliphatic carboxylic acids.

Nevertheless, the Examiner argues in the final Office Action on page 6, lines 1-7 "that the molar ratio . . . is from 0.1 to 0.5 as disclosed by Scata et al. in claim 9. It overlaps the recited claims." The Examiner then relies upon section 2144.05 in the MPEP to try and substantiate the instant obviousness rejection. However, first and foremost, even if there is a very slight overlap of the molar amount of the Lewis base between 0.4 moles, as claimed by Applicant, to 0.5 moles, as supposedly disclosed by Scata, et al. in claim 9, which Applicant denies as discussed *infra*, this slight overlap cannot be deemed sufficient and substantive enough to render Applicant's currently claimed adducts unpatentable, in which the Lewis base ranges from 0.4 all the way to 3 moles. In fact, the section in the MPEP relied upon by the Examiner is merely to establish a *prima facie* case of obviousness, which is rebuttable - not an actual finding of obviousness. Even assuming the Examiner's contention is correct that Scata, et al. does disclose such a range (i.e., 0.1 to 0.5 in claim 9, which facially seems to be without any support in the specification), in light of Applicant's unexpected results discussed below, Applicant believes it is clear that any *prima facie* case established by the Examiner has clearly been rebutted. In fact, nowhere in the final Office Action did the Examiner even address, much less consider Applicant's unexpected results that were outlined on page 7 in Applicant's response of June 8, 2009, which are discussed *infra*. Accordingly, Applicant

respectfully believes the currently claimed adducts comprise a higher Mg/LB ratio than those disclosed in Scata, et al., and that any *prima facie* case of obviousness has been sufficiently rebutted by Applicant's unexpected results discussed below.

In addition to the arguments above, Scata, et al. discloses in col. 2, lines 17-20, and col. 2, line 62 - col. 3, line 2,

> . . . and (c) an electron-donor compound preferably selected from the group consisting of esters of organic and inorganic oxygenated acids, in particular from the group consisting of esters of **aromatic** acids.
>
> ******
>
> Electron-donor compounds (c) useful in the practice of this invention and different from the already indicated esters of the oxygenated acids, include ketones, aldehydes, ethers, amides, P-compounds such as phosphines and phosphoramides. The preferred compounds are the alkyl esters of the **aromatic** acids. Some typical examples of said esters are the alkyl **benzoates**, alkyl **toluates** and alkyl **anisates**. Ethyl **benzoate**, methyl **toluate** and methyl **anisate** are representative compounds. (Emphasis added)

Alternatively, Applicant is currently claiming, in part, Lewis base adducts, wherein the aprotic Lewis base is selected from C_2-C_{20} **aliphatic** ethers and alkyl esters of C_1-C_{20} **aliphatic** carboxylic acids. However, the Examiner has not sufficiently explained *why*, absent Applicant's specification, one of ordinary skill in the art would have modified the disclosure of Scata, et al. to remove the aromatic electron-donor compounds therein for Applicant's currently and specifically claimed aliphatic, aprotic Lewis bases. However, this is the Examiner's initial burden to establish a *prima facie* case

of obviousness. See MPEP §2142. Therefore, for the aforementioned reasons alone, Applicant respectfully believes the instant rejection should be withdrawn.

Notwithstanding the above, as outlined in Applicant's specification on page 1, lines 3-6, and page 2, lines 19-21,

> The present invention relates to Lewis base adducts comprising compounds of a specified formula and including at least a magnesium compound and a Lewis base in specific amounts. The adducts of the present invention are particularly useful as precursors of Ziegler-Natta catalyst components for the polymerization of olefins.
>
> ******
>
> The applicant has now found novel precursors that upon reaction with Ti compounds generate in high yields catalyst components with **high polymerization activity** and that during said reaction do not substantially generate hydrogen chloride. (Emphasis added)

Accordingly, the currently claimed adducts not only do not substantially generate hydrogen chloride, but they also have unexpectedly high polymerization activities. This is evidenced by Example 6 and Comparative Example 7 in Applicant's specification. In particular, the Lewis base adduct of Example 6 and Comparative Example 7 were prepared in identical processes; however, the Lewis base adduct of Example 6 comprised **0.49 mol.** of the currently claimed aprotic Lewis base, whereas Comparative Example 7 comprised only **0.17 mole** of the currently claimed aprotic Lewis base. Thereafter, the yields of the resultant catalysts were 27.6 Kg/g from Mg for Example 6 versus 7.8 Kg/g from Mg for Comparative Example 7. Therefore, the Lewis base adducts of the present subject

matter having the currently and specifically claimed molar ratio for the aprotic Lewis base unexpectedly produced a catalyst having a yield **over 253% greater** than a Lewis base adduct not having the currently and specifically claimed molar ratio for the aprotic Lewis base.

In light of the above, Applicant respectfully believes claims 18 and 20-23 are patentably distinct over Scata, et al. As such, Applicant respectfully requests the Examiner to reconsider and withdraw the current rejection.

11. Rejection of Claims 20-21 Under 35 U.S.C. §103(a) to Scata, et al. in view of Zakharov, et al.

Claims 9, 10, and 12:

As outlined *supra*, the U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under §103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

Accordingly, for the Examiner to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine

reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP §2142.

For the sake of brevity, Applicant's arguments in section I regarding Scata, et al. are incorporated herein by reference in their entirety. In this regard, with respect to the instant rejection, Zakharov, et al. does not remedy the deficiencies of Scata, et al.

In particular, the current Office Action states on page 5, lines 1-8,

> Zakharov et al. teaches a method for the preparation of an alkoxymagnesium halide/Ti compound catalyst system suitable for the polymerization of olefins in the presence on an inert solvent, i.e., dialkyl ether or THF (page 3, lines 19-27, and claim 1).
>
> It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Scata and Zakharov to obtain the invention as specified in the claim [*sic*] 20-21, motivated by the fact that the resulting catalyst is very active for the polymerization, and eliminates additional activation catalyst steps (page 2, lines 8-10).

However, as previously discussed in Applicant's response of June 9, 2009, Zakharov, et al. only merely discloses THF, not to mention a myriad of other solvents, can be used as an **inert solvent for a Grignard reaction**. In fact, Zakharov, et al. discloses magnesium and a compound denoted as RX are, "brought into contact with one another in the presence of an inert solvent." See page 3, lines 19-21 in

Zakharov, et al. Accordingly, this is clearly different than Applicant's currently claimed Lewis base adducts comprising a compound of formula $MgCl_n(OR)_{2-n}$, and an aprotic Lewis base (LB) that are in molar ratios to each other defined by formula $MgCl_n(OR)_{2-n}LB_p$ in which n is from 0.1 to 1.9, p ranges from 0.4 to 3, R is a C_1-C_{15} hydrocarbon group, and the aprotic Lewis base is selected from C_2-C_{20} aliphatic ethers and alkyl esters of C_1-C_{20} aliphatic carboxylic acids. Furthermore, Applicant respectfully believes the Examiner has not explained *why*, absent Applicant's specification, one of ordinary skill in the art would have selectively plucked inert solvent, THF, from the disclosure of Zakharov, et al. and substituted it for the aromatic electron-donor compounds (c) in Scata, et al. However, this is the Examiner's initial burden to establish a *prima facie* case of obviousness. See MPEP §2142. In fact, Applicant respectfully reiterates, if anything, one of ordinary skill in the art would only have gleaned from Zakharov, et al. that THF could be used as an inert solvent in a Grignard reaction since, after all, this is what Zakharov, et al. discloses.

In response to the Examiner's argument that since Zakharov, et al. is merely being used as a secondary reference to "teach[] a certain concept, namely the use of THF as an electron donor," Applicant responds as follows. In particular, as outlined *supra*, Zakharov, et al. does not teach that THF can be used as an electron donor; rather, Zakharov, et al. **merely discloses that THF can be used as a solvent in a Grignard reaction.** See page 3, lines 19-21 in

Zakharov, et al. (i.e., magnesium is brought into contact with a compound RX).

In light of the above, Applicant respectfully believes claims 20 and 21 are patentably distinct over Scata, et al. in view of Zakharov, et al. As such, Applicant respectfully requests the Examiner to reconsider and withdraw the current rejection.

Given all of the arguments above, Applicant respectfully believes the currently pending claims are unobvious and patentably distinct from Scata, et al. and Zakharov, et al. As such, Applicant respectfully requests the instant rejections to be withdrawn.

Respectfully submitted,

Date: April 12, 2010

By: _____
Jarrod N. Raphael
Registration No. 55,566
Customer No. 34872

Newtown Square Center
3801 West Chester Pike, Bldg. B
Newtown Square, PA 19073
Tel: 610-550-3338
Fax: 713-308-5543

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office (Fax. No. 571-273-8300) on April 12, 2010.

Jolene A. Gutter
Type or printed name of person signing this certificate

Signature

Claims Appendix

Claims 1 - 17: (Cancelled)

18. (Rejected) Lewis base adducts comprising a compound of formula $MgCl_n(OR)_{2-n}$, and an aprotic Lewis base (LB) that are in molar ratios to each other defined by formula $MgCl_n(OR)_{2-n}LB_p$ in which n is from 0.1 to 1.9, p ranges from 0.4 to 3, R is a C_1-C_{15} hydrocarbon group, and the aprotic Lewis base is selected from C_2-C_{20} aliphatic ethers and alkyl esters of C_1-C_{20} aliphatic carboxylic acids.

19. (Cancelled)

20. (Rejected) The adducts according to claim 19 in which the C_2-C_{20} aliphatic ether is at least one cyclic ether comprising 3-5 carbon atoms.

21. (Rejected) The adducts according to claim 20 in which the ether is tetrahydrofurane.

22. (Rejected) The adducts according to claim 18 in which p ranges from 0.45 to 3.

23. (Rejected) The adducts according to claim 18 in which n ranges from 0.4 to 1.6.

24. (Withdrawn) A process for preparing Lewis base adducts comprising a compound of formula $MgCl_n(OR)_{2-n}$, and an aprotic Lewis base (LB) that are in molar ratios to each other defined by formula $MgCl_n(OR)_{2-n}LB_p$ in which n is from 0.1 to 1.9, p ranges from 0.4 to 3, R is a C_1-C_{15} hydrocarbon group, and the aprotic Lewis base is selected from C_2-C_{20} aliphatic ethers and alkyl esters of C_1-C_{20} aliphatic carboxylic acids; the process comprising

- contacting organometallic compounds of formula Cl_mMgR_{2-m}, where m is from 0 to 2, and R is a C1-C15 hydrocarbon group; with
- an OR source where R is a C_1-C_{15} hydrocarbon group in presence of the aprotic Lewis base (LB).

25. (Withdrawn) The process according to claim 24 in which the OR source is selected from ROH alcohols and orthosilicic acid esters where R is a C_1-C_{15} hydrocarbon group.

26. (Withdrawn) The process according to claim 24 in which Cl_mMgR_{2-m} is formed, and further exchange with the OR source takes place in a single step.

27. (Withdrawn) A process for preparing Lewis base adducts comprising a compound of formula $MgCl_n(OR)_{2-n}$, and an aprotic Lewis base (LB) that are in molar ratios to each other defined by formula $MgCl_n(OR)_{2-n}LB_p$ in which n is from 0.1 to 1.9, p ranges from 0.4 to 3, R is a C_1-

C_{15} hydrocarbon group, and the aprotic Lewis base is selected from C_2-C_{20} aliphatic ethers and alkyl esters of C_1-C_{20} aliphatic carboxylic acids; the process comprising reacting mixtures of $MgCl_2$ and $MgOR_2$ wherein R is a C_1-C_{15} hydrocarbon group in presence of the aprotic Lewis base (LB).

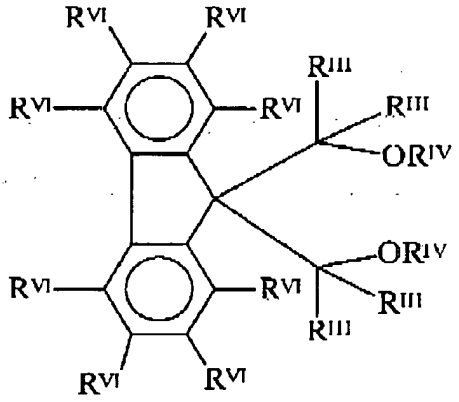
28. (Withdrawn) A catalyst component obtained by contacting:

- at least one Lewis base adduct comprising a compound of formula $MgCl_n(OR)_{2-n}$, and an aprotic Lewis base (LB) that are in molar ratios to each other defined by formula $MgCl_n(OR)_{2-n}LB_p$ in which n is from 0.1 to 1.9, p ranges from 0.4 to 3, R is a C_1-C_{15} hydrocarbon group, and the aprotic Lewis base is selected from C_2-C_{20} aliphatic ethers and alkyl esters of C_1-C_{20} aliphatic carboxylic acids;
- with at least one compound comprising at least one transition metal belonging to one of the groups 4 to 6 of the Periodic Table of Elements (new notation).

29. (Withdrawn) The catalyst component according to claim 28 in which the compound comprising at least one transition metal is a transition metal compound selected from at least one titanium compound of formula $Ti(OR'')_nX_{y-n}$ in which n is between 0 and y; y is a valence of titanium; X is halogen; and R'' is an alkyl radical comprising 1-10 carbon atoms or COR'' in which R'' is a C_1-C_{10} hydrocarbon group.

30. (Withdrawn) The catalyst component according to claim 28 further comprising at least one electron donor selected from at least one ester, ether, amine, ketone, or mixture thereof.

31. (Withdrawn) The catalyst component according to claim 30 in which the electron donor is selected from 1,3-diethers of formula (III)



(III)

where

R^{VI} are equal or different, and are hydrogen, halogens, linear or branched C_1-C_{20} alkyl radicals, C_3-C_{20} cycloalkyl radicals, C_6-C_{20} aryl radicals , C_7-C_{20} alkylaryl radicals and C_7-C_{20} aralkyl radicals, optionally comprising at least one heteroatom selected from the group consisting of N, O, S, P, Si and halogen as a substitute for carbon, hydrogen, or both;

R^{III} are equal or different, and are hydrogen or C_1-C_{18} hydrocarbons

R^{IV} are equal or different, and are C_1-C_{18} hydrocarbons.

32. (Withdrawn) The catalyst component according to claim 31 in which R^{VI} are equal or different, and are Cl, F, or combinations thereof.

33. (Withdrawn) The catalyst component according to claim 31 in which R^{VI} comprise Cl, F, or combinations thereof as the substitutes for carbon or hydrogen.

34. (Withdrawn) A catalyst system for polymerizing alpha-olefins of formula CH_2=CHR', wherein R' is hydrogen or a hydrocarbon radical comprising 1-12 carbon atoms, obtained by contacting a catalyst component obtained by contacting at least one Lewis base adduct comprising a compound of formula $MgCl_n(OR)_{2-n}$, and an aprotic Lewis base (LB) that are in molar ratios to each other defined by formula $MgCl_n(OR)_{2-n}LB_p$ in which n is from 0.1 to 1.9, p ranges from 0.4 to 3, R is a C_1-C_{15} hydrocarbon group, and the aprotic Lewis base is selected from C_2-C_{20} aliphatic ethers and alkyl esters of C_1-C_{20} aliphatic carboxylic acids, with at least one compound comprising at least one transition metal belonging to one of the groups 4 to 6 of the Periodic Table of Elements (new notation) with one or more organoaluminum compounds.

35. (Withdrawn) The catalyst system according to claim 34 further comprising an external electron donor compound.

36. (Withdrawn) A process for polymerizing alpha-olefins carried out in presence of a catalyst system for polymerizing alpha-olefins of formula $CH_2=CHR'$, wherein R' is hydrogen or a hydrocarbon radical comprising 1-12 carbon atoms, obtained by contacting a catalyst component obtained by contacting at least one Lewis base adduct comprising a compound of formula $MgCl_n(OR)_{2-n}$, and an aprotic Lewis base (LB) that are in molar ratios to each other defined by formula $MgCl_n(OR)_{2-n}LB_p$ in which n is from 0.1 to 1.9, p ranges from 0.4 to 3, R is a C_1-C_{15} hydrocarbon group, and the aprotic Lewis base is selected from C_2-C_{20} aliphatic ethers and alkyl esters of C_1-C_{20} aliphatic carboxylic acids, with at least one compound comprising at least one transition metal belonging to one of the groups 4 to 6 of the Periodic Table of Elements (new notation) with one or more organoaluminum compounds.

Evidence Appendix

NONE

Related Proceedings Appendix

NONE